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ABSTRACT

The five research papers that comprise this document report on research into the impact of the inception of television reception on residents of a Canadian town, "Notel." The introductory section tells how Notel and two other similar Canadian towns that already had television reception were studied just before Notel received television reception in 1973, and again two years later; the section also explains the cross-sectional and longitudinal comparisons that were made in the research. The research papers separately outline findings on the impact of television on children's aggressive behavior, reading skills, cognitive development, and sex role perceptions, as well as on residents' participation in community activities. The findings presented suggest that television viewing may result in the following: increases in children's physical and verbal aggression; decreases in reading skills, varying by sex and grade level; decreases in some cognitive skills; formation of more traditional sex role attitudes; and decreases in participation in community activities. (GT)

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THE IMPACT OF TELEVISION: A NATURAL EXPERIMENT INVOLVING THREE COMMUNITIES

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The paper presented by Tannis MacBeth Williams at the meeting of the International Communication Association, May 1979, was based on a research project she directed.

This set of papers provides more extensive coverage of the method and findings of the studies within the project and includes the names of the authors of each study.

Television exposure and children's aggressive behaviour,
by Lesley A. Joy, Meredith M. Kimball, and Merle L. Zabrack.

Television and reading skills,
by Raymond S. Corteen.

Television and cognitive development,
by Linda F. Harrison and Tannis MacBeth Williams.

Television and children's sex role attitudes,
by Meredith M. Kimball.

Television availability and adult behaviour,
by Peter Suedfeld, Darylynn Rank, Dennis Rank, and Brian Little
(This paper is not yet available.)

Television and Community Life,
by Tannis MacBeth Williams and Gordon C. Handford

The research described in these papers was funded by the Canada Council. The manuscript for a book based on this research project is now in preparation. Further information about the work can be obtained from Tannis MacBeth Williams, Department of Psychology, University of British Columbia, Vancouver, B.C., Canada, V6T 1W5. Telephone: (604) 228-4826.

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A longitudinal study based on a natural experiment involving television was recently conducted in three Canadian towns. The purpose of the research was to assess the impact of the inception of television reception on a community and its residents. The opportunity to study people both before and after they became regular television viewers was expected to shed light on some theoretical issues and in particular to help arbitrate the central chicken-and-egg question as to whether watching television produces certain kinds of people or whether certain kinds of people watch television.

In the summer of 1973 it was learned (from M. Morrison) that a Canadian community currently without television was due to receive reception for the first time within a year. This town seemed unique because although it was one of the last in North America to receive television, it was not otherwise unusual. Unlike other Canadian towns then without television, it was not physically isolated and did not have a special population. The community was accessible by road, bus and train and almost all of its residents had seen television elsewhere; they could not, however, watch on a regular basis. Located in a valley, the town happened to be missed by existing transmitters.

We gave this town the pseudonym Notel, and studied it and two other towns chosen for comparison, Unitel and Multitel, just before Notel got television and again two years later. During the first phase of the research, Notel had no television reception. Unitel received CBC, the Canadian government-owned channel, and Multitel received CBC and the three major U.S.A. channels, ABC, CBS, and NBC. When reception came to Notel in November, 1973, it was one channel, CBC. At the same time, reception in Unitel improved by the addition of a second CBC channel with better reception. Multitel reception did not change.

The design of the research enabled both cross-sectional and longitudinal comparisons to be made. Considering only the data collected before Notel got

television (first phase), we could make cross-sectional comparisons among the three towns, i.e., compare different people of the same age levels. The same thing could be done for data from the second phase. Cross-sectional comparisons could also be made between the first and second phases by comparing same-aged children. Finally, we could make longitudinal comparisons for the same people between the first and second phases, provided that those people, now two years older, were still available.

The extent to which the three towns were comparable in ways other than television reception is important. Data from the 1971 Canadian census revealed some slight differences, but on the whole the towns were remarkably similar. For example, for Notel, Unitel, and Multitel, respectively, the 1971 populations were 658, 693, and 872. In each case the population of the area served by the town (e.g., via the schools) was about four times as large. The mean incomes of family heads were $7377, $6854, and $8055. The proportions of family heads with English as their official language were 88%, 93%, and 95%; with English as their mother tongue, 74%, 81%, and 83%; with a Canadian birthplace, 77%, 90% and 77%; and educated beyond high school, 37%, 23%, and 21%. The proportions of the labor force in blue collar jobs were 62%, 72%, and 77%. The principal sources of income for Notel were logging, farming and railroad; for Unitel, logging and railroad; and for Multitel, logging and mining. To our knowledge, there were no major social changes in terms of such things as bus, rail, or plane service in the two year period between the phases of data collection. The road linking Notel and Unitel improved significantly at about the same time as television arrived, but this did not affect Notel's access to the nearest larger community, which is reached by a different road. In general, we feel confident that lack of television reception was the overwhelming difference between Notel and the other towns.

Data concerning television viewing habits confirm that before reception came to Notel, its residents differed markedly in regular television exposure from the residents of Unitel and Multitel; the median numbers of hours of viewing per week were 0, 21, and 23, respectively. The length of time taken for television to saturate the community was not a problem in this study. By the first phase of data collection most Notel residents had already purchased television sets in anticipation of the arrival of reception. Two years later, in the second phase of data collection, more than 90% of the homes had telvision, and the median number of hours of viewing per week was 25 in all three towns. Thus two years after the inception of television Notel residents, like their Unitel and Multitel counterparts, were on average viewing about the same amount of television as other North Americans.

The project included assessments of the impact of television on children's aggressive behavior; reading skills; associative fluency (creativity), block design, and vocabulary scores; sex-role perceptions and attitudes; and participation in community activities. Participation in community activities by adults, and problem solving skills and environmental perceptions of adults were also examined.

Children's Aggressive Behavior. The research on the impact of television on children's aggressive behavior was conducted by Lesley A. Joy, Meredith M. Kimball, and Merle L. Zabrack.[1] The multiple measures of aggression used in this study were observation of verbal and physical incidents of aggression during free play on the school playgrounds, peer ratings of aggression, and teacher ratings of aggression.

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[1] These authors are listed alphabetically to reflect their equivalent contributions. Authors Joy and Kimball are now at Simon Fraser University.

In both phases of the project, five male and five female children in each of the three towns were observed. Before Notel got television Grades 1, 2, 4, and 5 were observed, and two years later, Grades 1, 2, 3, and 4. Children observed during the first phase of the study were observed again in the second phase, if available. Of the 60 third and fourth graders observed in the second phase, 44 (73%) had been in the first phase sample (in Grades 1 and 2), and 16 were studied for the first time in the second phase. Each child was watched by two trained observers during 21, one-minute intervals over a seven to ten day period. No child was observed for two consecutive minutes. Reliability was greater than .8 in both phases of the study. The observers used a checklist, noting how many times each of 14 physical and 9 verbal behaviors was displayed by the child being observed during that interval.

A repeated measures analysis of variance (three towns, two sexes, two phases) based on the longitudinal study of the 44 children observed both before and after Notel got television revealed significant increases in both verbal and physical aggression for Notel, but not the other two towns. Before Notel had television reception, there were no significant town differences in physical aggression. Multitel children were significantly more verbally aggressive than Unitel children, and Notel and Unitel children did not differ in verbal aggression. Two years after their town received television, the same Notel children were significantly higher in both verbal and physical aggression than their peers in the other two towns. Males were more physically aggressive than females, a replication of the finding of other researchers. There were no sex differences for verbal aggression.

Cross-sectional analyses were conducted on the data for the total of 240 children in part to determine whether developmental trends could have accounted for the increases in aggression found in the longitudinal analyses. The variables

in these cross-sectional analyses of variance were town (3), sex (2), age/grade (4), and phase (2). There was no evidence that age and either physical or verbal aggressive behavior were systematically related, indicating that the differences between the first and second phase obtained in the longitudinal study are not attributable to developmental change. The pattern of town differences for physical aggression obtained in the cross-sectional analyses was the same as in the longitudinal analysis, but not statistically significant. There were no substantial first phase differences among the towns, but Notel children were more physically aggressive in the second phase than children in the other two towns, and Multitel children were also more physically aggressive than Unitel children. Children in all towns increased in physical aggression from the first to the second phase, with Notel children displaying the largest increase. In the first phase of the study, Multitel children in the cross-sectional sample were significantly more verbally aggressive than their peers in Notel and Unitel, who did not differ significantly. Only Notel children increased significantly in verbal aggression between the first and second phase. In the second phase, Notel children were more verbally aggressive than children in Multitel, who were in turn more aggressive than children in Unitel. As was the case in the longitudinal analysis, males were more physically aggressive than females, but unlike that analysis, males in the cross-sectional analysis were also more verbally aggressive, and only males increased significantly in verbal aggression from the first to the second phase of the study.

In both phases of the study, the teacher and peer ratings were inter-correlated and were also correlated with the observational measures of aggression, lending validity to those observations.

To assess potential qualitative differences in aggression among the towns, specific behaviors were examined. The three most frequently displayed physically

aggressive behaviors and the three most frequently displayed verbally aggressive behaviors were compared for the three towns. The aggressive repertoires of the children in the three towns were similar in both phases of the study. They pushed, hit each other above the waist, and interfered in the activity of another child. Verbally, they made disparaging remarks, argued, and commanded each other in loud and angry voices. The only difference in the second phase was that instead of interfering in the activity of another child, children in Notel chased, children in Unitel threw objects, and children in Multitel kicked and tripped. These results imply that although Notel children's physical and verbal aggressive behavior increased from the first to the second phase of the study, their repertoires did not change, at least in terms of the 23 types of aggressive behavior observed in this study.

The increases in aggression obtained did not seem to be due to increases in the aggressive behavior of a particular subgroup; children below the median in first phase aggression in all three towns increased on the average as much as those initially above their town's median, and this was true for both verbal and physical aggression. Further, children above the median in aggression in the first phase did not seem to select more aggressive programs as their favorites. These findings contradict those obtained in some other studies, but some methodological differences are involved. In the other studies, aggressive behavior was observed just after some specifically aggressive content had been viewed, usually for a relatively short period.

In general, the results of both the longitudinal and cross-sectional analyses indicated that two years following the inception of television in their community, Notel children had increased in both physical and verbal aggression. Furthermore, their aggression scores were now higher than those of children in Multitel. This finding coupled with the finding that Multitel children were initially highest in

verbal but not in physical aggression, might suggest that the effects of television viewing are not necessarily cumulative. Given that there is more aggression and violence depicted on the U.S. networks than on CBC (Williams, Zabrack, & Joy, 1977), and that the level of aggression portrayed on U.S. television was increasing during the period studied (Gerbner & Gross, 1976), children in Multitel might have been expected to be the most aggressive in both phases of this study. This did not occur. However, while there is less aggressive content in programs shown on CBC than on ABC/CBS/NBC, the difference is not substantial. Williams et al. (1977) found that 18.4% of the program segments from CBC contained aggression (physical and/or verbal), by comparison with 21.5% of the segments in programs taped from ABC/CBS/NBC. And although CBC carried only two crime shows per week during this research period, it carried sixteen situation comedies per week, which contain high levels of verbal aggression. CBC may well depict a sufficient amount of aggression to affect its viewers; certainly, the findings of this study of children's aggressive behavior fit with that hypothesis.

Television may have had a non-specific energizing effect (Tannenbaum & Zillman, 1975) or disinhibiting effect on the children in Notel. Comstock, Chaffee, Katzman, McCombs, and Roberts (1978) contend that the general arousal or excitation associated with television may facilitate learning of the content portrayed more than the nature of the content facilitiates learning. Since television was relatively novel to Notel children, arousal effects may have been greater for them. With regard to the possible disinhibiting effect of television, it is important to remember that social learning theory (Bandura, 1973) involves not only the notion that specific behaviours may be learned by viewing a televised model. As Bandura (1978) has recently outlined, exposure to televised violence can also alter restraints over aggressive behavior, and desensitize and habituate people to violence. The disinhibition hypothesis fits better with the finding

that Notel children increased in aggression than would a theory restricted to modelling of specific behaviors. It also provides a reasonable explanation of the findings obtained by Belson (1977) in England for the relationship between television and the physically aggressive behavior of adolescent boys.

Finally, it should be noted that the findings in this study for verbal aggression were as substantial, and in some ways more clearcut, than those for physical aggression. Multitel children were initially highest in verbal aggression, and Notel and Unitel children did not differ. Two years after their town received television, Notel children were highest in verbal aggression. The finding that television may have had an impact on children's verbal aggressive behavior is not surprising. Most content analyses have focused on the depiction of physical aggression, but Williams, Zabrack, & Joy (1977) found that whereas 27% of the program segments in crime shows contained aggression, most of which was physical, 40% of the segments of situation comedies contained aggression, almost all of which was verbal.

Children's Reading Skills. Raymond S. Corteen is the author of the study of the impact of television's inception on children's reading skills. Children's reading habits have been studied fairly extensively in relation to television (e.g., Himmelweit, Oppenheim, & Vince, 1958; Maccoby, 1951; Murray & Kippax, 1978; Schramm, Lyle and Parker, 1961), but there has been relatively little research involving the assessment of actual reading skills.

Before Notel had television, we assessed the reading skills of children in Grades 2, 3, and 8 in all three towns. Two years later, children in Grades 2, 3, and 8 were tested, and children in Grades 4 and 5 who had been tested two years earlier and were still available were retested. In all, about 180 students were tested in the first phase and 300 in the second phase.

Portions of the Gates-McKillop (1962) Reading Diagnostic Tests were used.

Individually, each child was given three tests consisting of single words, phrases of two to four words, and nonsense words. The items were presented one at a time in a tachistoscope, which controlled the duration during which the items were visible. In both phases, Notel and Unitel children were tested in the month of November and Multitel children were tested in January. If anything, in terms of age and school experience, this would have given a slight advantage, particularly at the Grade 2 level, to Multitel children.

The results varied according to the grade and sex of the children assessed. At the Grade 2 level, there was a relationship between television experience and reading skills for boys but not for girls. Before their town had television reception, Notel boys in Grade 2 were better readers than male second graders in both Multitel and Unitel, who did not differ. Two years later there had been a significant decrease in the scores of Notel male second graders, to the extent that there were no longer any significant town differences. For girls, there were no significant differences between the towns both before and after Notel got television. Thus the effect at the second grade level was specific to boys. Stated in a slightly different way, the effect of television seemed to be to introduce a sex difference in the reading skills of second graders. The only instance in which Grade 2 girls did not obtain higher scores than Grade 2 boyd was in Notel, before television. Two years later, and in the other towns at both times, the mean girls' score was higher than that for boys.

At the Grade 3 level, there was again evidence that television has a negative effect on children's reading skills, but the pattern was a bit different than that for Grade 2. There was a significant decrease in the total reading scores of Notel third graders from Time 1 to 2, and this occurred for both girls and boys. Before Notel had television, girls in Grade 3 had significantly higher

scores than third grade girls in the other towns, but afterward, their scores were significantly worse. Boys in Grade 3 in Notel were not initially difference from boys in the other towns, but two years after the inception of television in Notel, male third graders there had significantly lower reading scores than male third graders in the other two towns. In other words, the performance of both male and female third graders had fallen below the reading performance of their age mates in Unitel and Multitel. This is perhaps not surprising, since they had been in Grade 1 when television arrived. To the extent that television has an impact on children's reading skills, one might expect the impact to be greatest for children just learning to read.

The longitudinal data, comparing children in Grades 2 and 3 before Notel got television with themselves two years later, when they were in Grade 4 and 5, helps in interpreting the cross-sectional findings just discussed. The decline in reading skills observed cross-sectionally in Grades 2 and 3 following the inception of television in Notel did not occur for longitudinal subjects, who maintained their superior reading skills relative to their age-mates in Unitel and Multitel. In other words, once the superior skills had been acquired, there was no evidence that availability of television diminished them. To the extent that the declines observed cross-sectionally can be attributed to television, it appears that its impact is large on the acquisition of reading skills.

At the Grade 8 level, there were no differences in reading performance among the towns either before or after Notel got television. The test was relatively easy for children at this age level, so the lack of differences may reflect a ceiling effect. It is also possible, of course, that by the eighth grade television experience is unrelated to performance on a test of reading skills.

The major results could be interpreted as indicating a deleterious effect of television on reading in the early grades, but several alternative explanations

are also possible. The most obvious of these would be that the different methods of teaching reading were used in the three schools. This was investigated and did not seem to be the case. It was not possible to evaluate such subtle effects as differing personalities among the Grade 1, 2, and 3 teachers. Such differences would, however, be expected to be randomly distributed across the communities, and if the primary cause of reading skill differences, would be unlikely to produce a sensible pattern of results in relation to the television continuum. Other factors may have had some influence, of course. It would be naive to attribute the reading differences among the towns entirely to television, but the results are suggestive.

Cognitive Development. A study of the relationship between television viewing experience and some cognitive abilities was conducted by Linda F. Harrison and Tannis MacBeth Williams.

There has been considerable speculation about potentially positive and negative relationships between children's television viewing habits and their cognitive development. We assessed the impact of television on three well-established primary abilities, verbal ability, spatial ability, and ideational fluency. It was hypothesized that television would have a negative effect on ideational fluency and a positive effect on verbal ability. Although it is not good scientific practice to put forth a null hypothesis, we chose to measure spatial ability because we could think of no rationale whereby it would be affected by exposure to television.

The measure of verbal ability used was the vocabulary subtest of the Wechsler Intelligence Scale for Children (WISC), and the measure of spatial ability was the WISC block design subtest. Scaled scores, which correct for age differences, were used in the analyses. The ideational fluency tasks were chosen from Wallach and Kogan's (1965) work on creativity. In the unusual uses task, a verbal measure of ideational fluency, the child is asked to name as many uses as possible for a common item, e.g., a newspaper. Figural ideational fluency was measured by showing a line drawing and asking the child to say all the things the drawing could be.

These cognitive tasks were given in both phases of the project to all children in Grades 4 and 7 in all three towns, a total of 160 children in the first phase and 146 in the second phase. In addition, they were given in the second phase to those children in Grades 6 and 9 who had been tested two years earlier in Grades 4 and 7. There were 137 (86%) of these longitudinal subjects still available.

Analyses of variance on the block design test scaled scores revealed no town differences in either phase of the study for either the cross-sectional or longitudinal samples. In the cross-sectional sample, the scores of boys were higher than those of girls in all three towns in both phases of the study. In the longitudinal sample in the second phase, this pattern held true for Grade 6, but the superiority of males had disappeared in Grade 9. The finding that in general, the performance of boys was better than that for girls, is consistent with previous research using the block design task.

The vocabulary results were interesting, because if data had been available only from the first phase of the study we might have concluded that television had a positive effect on vocabulary scores. Before Notel had television reception, Multitel children had significantly higher vocabulary scaled scores than Notel children, and Unitel children scored in between. But in the second phase there were no town differences, not because the mean score of Notel children increased but because the Multitel mean decreased. Multitel vocabulary scores were the only ones to change from the first to the second phase, and accounted for the significant town by phase interaction in the cross-sectional sample; this interaction was not statistically significant for the longitudinal sample. In sum, the results for the WISC vocabulary and block design subtests indicated that television had no effect on performance on these tasks. It should be noted, however, that the children in this study were in Grades 4 and 7. Schramm, Lyle, & Parker (1961), found evidence that children with television come to school (i.e., Grade 1) with better vocabulary scores than children without television, but the differences disappear by the end of elementary school. It would have been helpful

in assessing the impact of television on children's vocabulary scores to have tested first graders. This was not done because of a need for the entire project to limit the number of studies conducted in any one grade.

Before they had television reception, the verbal ideational fluency scores of Notel children in Grades 4 and 7 were significantly higher than those of their age-mates in the other two towns, but two years later, there were no differences in the cross-sectional analysis. Put differently, only Notel children's verbal fluency scores changed from the first to the second phase of the study, and they decreased significantly, as had been hypothesized. The pattern of results was the same in the longitudinal analysis based on the scores of fourth and seventh graders from the first phase and sixth and ninth graders from the second phase.

For the figural fluency scores, there were no town differences in either phase of the project in the cross-sectional comparisons, but Unitel scores increased significantly from the first to the second phase. In the longitudinal analysis there were no town differences in either phase and no change for any of the towns.

The chicken-and-egg question of whether the relationship between creativity scores and television exposure results from differential use of television by more and less creative children was of some interest to us. Wade (1971) had found a negative relationship for adolescents between hours of television viewing and creativity scores, and evidence that more creative adolescents spend more time and energy on activities that preclude viewing. However, when we divided the Notel children at the median according to their verbal ideational fluency scores obtained before Notel got television, we found no difference in the mean hours of viewing reported after two years of exposure to television. To the extent that the direction of influence can be determined from natural experiments such as this one, it would appear that the availability of television for regular viewing leads

to a decrease in verbal ideational fluency scores, rather than vice-versa.

To sum up the ideational fluency results, there was no evidence that television exposure is related to children's performance on figural ideational fluency measures, but there was strong evidence that television exposure is negatively related to children's performance on verbal ideational fluency tasks. This is especially interesting in light of the finding that children's vocabulary scores, another verbal assessment, were unrelated to television exposure.

If the ways in which television might influence its viewers are considered, two possibilities seem most salient. The content of what is viewed might have some impact, and this is what we hypothesized for the WISC vocabulary scores. The results did not support the hypothesis. On the other hand, the hypothesis may have been naive. Perhaps children without television acquire vocabulary skills from reading, and those with television acquire it that way. It is possible that the general orientation of television programming toward convergent problem-solving, that is, coming up with one right answer, and the non-interactive nature of current programming, have something to do with the apparently negative impact of television on children's verbal ideational fluency scores. However, this explanation would not readily explain the different results obtained for the figural ideational fluency items, i.e., the lack of relationship between television exposure and figural fluency.

A second way in which television might affect viewers is through displacement, in that viewing time is not spent in other activities. This seems to provide a better explanation of the higher scores of Notel children before their town received television. Anecdotally, it seemed as if many of their responses to the unusual uses items were ones they had tried, or were based on their own play experiences.

Children's Sex Role Perceptions. Meredith M. Kimball is the author of the study of the relationship between televison and children's sex role perceptions and attitudes.

It has been found in previous research that men outnumber women in television programming (Dominick & Rauch, 1972; McArthur & Eisen, 1976; McNeil, 1975; Sternglanz & Serbin, 1974; Williams, Zabrack & Joy, 1977), and both men and women are presented in traditional sex roles (Busby, 1975; Long & Simon, 1974; McArthur & Eisen, 1976; Sternglanz & Serbin, 1974). It has also been found that children's behavior is related to their viewing of male and female models on television (Beuf, 1974; Lyle & Hoffman, 1972; McArthur & Eisen, 1976). In this study it was hypothesized that children in Notel would have less stereotyped attitudes toward sex roles before the inception of television reception than two years later.

Sex role perceptions were measured with the Sex Role Differentiation (SRD) scale designed by Lambert (1971). The scale has two sections, requiring children to rate how appropriate or frequent certain behaviors are for boys and girls their own age, and a set of parent scales on which children rate how frequently their mother and father perform specific tasks. For each item, the child rates (1-7) how accurately the item describes boys their own age (or on the parent scale, their father) and how accurately (1-7) it describes girls their own age (their mother). The differences are summed across items, with a higher score indicating a greater tendency to segregate the sexes socially and psychologically.

The peer and parent SRD scales were completed by sixth and ninth graders in all three towns in both phases of the study (a total of 438 children). Because the children were asked questions about their parents, responses were made anonymously, so longitudinal analyses were not possible.

On the average, boys held more traditional perceptions of their parent's sex role behavior than did girls, but otherwise, parent perceptions did not vary (by town or phase of the study).

On the peer scale, boys again displayed more traditional sex role perceptions than girls, but this was true only of the towns with television (including Notel, two years after the arrival of TV reception). In other words, before Notel had television, there was no sex difference in attitudes toward peer behavior, but a sex difference did occur two years later as it did in the other towns in both phases of the study. The attitudes of both girls and boys in Notel had become more traditional after two years of television availability than prior to its arrival. Before Notel had television, boys there held less traditional sex role attitudes than boys in Unitel and Multitel; two years later, there were no town differences. In the case of girls, Notel and Unitel girls initially held less traditional views than Multitel girls; two years later, Notel girls held more traditional views than girls in in both Unitel and Multitel.

The pattern of differences according to town and phase of the study varied by grade in an interesting way. At both the Grade 6 and Grade 9 levels Notel children initially held less traditional attitudes about peer behavior than children in the other two towns. However, at the Grade 6 level, Notel children's peer perceptions became significantly more traditional (stereotyped) in the two years following the inception of television, whereas the attitudes of Unitel and Multitel children did not change. At the Grade 9 level, Notel children's attitudes did not change, whereas Unitel and Multitel children's peer perceptions became significantly less stereotyped over the same period.

This pattern suggests that the effect of introducing television for children at the Grade 6 age level was to bring about an increase in sex role stereotyping, but at the Grade 9 level, to prevent a decrease which otherwise occurred for children previously exposed regularly to television. The historical period between the first and second phases of data collection was one of general consciousness raising about sex role stereotypes. One would expect ninth graders to be more aware of and affected by such social change than sixth graders. It is therefore interesting that whereas in Grade 6 Notel children's attitudes became more traditional, in Grade 9, Unitel and Multitel children's peer attitudes became less traditional, and Notel children's attitudes did not change.

The finding that the mean Notel boys' and girls' peer scores increased significantly following the inception of television lends support to the hypothesis that children in Notel would have more traditional sex role attitudes after the introduction of television. It is interesting to note that differences between the phases of the study were found only with the peer scales. Attitudes toward peers may be more susceptible to change, whatever the cause, than perceptions of parents' behaviors.

Participation in Community Activities. A study dealing with the impact of television at the community level, in terms of the residents' participation in

community activities, was also included in the project. The authors are Tannis MacBeth Williams and Gordon C. Handford.

In most previous research on the effects of television, investigators have focused on television's impact on the skills, attitudes, habits, or behavior of individuals or groups. We thought some of the effects of television might be second-order effects. The presence of television in a community might affect the residents indirectly through the availability of other activites, and through patterns of participation and social interaction in these activities. We decided to use a system developed by Roger Barker and his colleagues to analyze the three towns in our project at a molar level.

Barker developed the concept of what he called a "behavior setting", essentially, a public place or activity. Examples of behavior settings would be: a curling club bonspiel, the Highway Motel, school sports day, free skating at the ice arena, Joe's Esso gas station, the Rod and Gun Club dance, rug-weaving bee at John Brown's, the R.C.M.P. station, the village park, Mary Brown's funeral. Behavior settings may occur once, regularly, or they may be ongoing. In the 1950's Barker and Wright (1954) analyzed the behavior settings of a community they called "Midwest". Midwest was about the same size as the three towns studied in this project.

Obviously, behavior settings are specific to communities, although categories of settings (e.g., sports, businesses) might be the same. In both phases of this research, lists of behavior settings were generated for the events of the previous year in each community by visiting the town and interviewing people, by personal inspection, and by going through community calendars and newspapers for the previous year. A questionnaire was then developed for each town (in each phase). The person filling out the questionnaire was asked to check off the behavior settings he or she had participated in during the previous year, and for each one

checked, to write out what had been done there (e.g., watched hockey games, played shortstop for the women's softball league, store customer, president of the mixed Curling Club).

In both phases of the study, children in Grades 7-12 filled out the behavior settings questionnaires at school. Questionnaires were also mailed to a random sample of adults on the voters' lists of each town. In the first phase, 1043 questionnaires were completed and two years later, 1269.

The first question of interest was whether the absolute number of settings would vary by town or phase of the study. One possible hypothesis is that television would have the effect of reducing the number of settings available. But the numbers were very comparable; 271 and 279 for Notel, 250 and 275 for Unitel, and 247 and 280 for Multitel, in the first and second phases, respectively. Thus there were larger increases between the first and second phase in the number of settings in Unitel and Multitel than in Notel, but the figures were all in the same general range.

Whereas the number of settings available did not seem to vary substantially in relation to the availability of television, use of the settings did vary. Setting use was examined in terms of number of "entries", the number of times each person had participated in (entered) each setting during the previous year. Both before they had television and two years later, Notel had significantly more setting entries than Unitel and Multitel, and the latter two towns did not differ. However, the absolute difference in mean number of entries between Notel and Unitel was much greater in the first phase (25% greater) than in the second phase (12%), and the same was true for Multitel (37% and 14%). Those figures were based on cross-sectional comparisons among the towns within each phase. Longitudinal analyses for only those subjects who answered questionnaires in both phases (481

people) revealed the same trend, a larger drop in mean number of entries for Notel (65.3 to 50.2) than for Unitel (50.1 to 46.6) and Multitel (44.7 to 41.2).

There were some interesting findings concerning age differences in relation to the availability of television and participation in community activities. The subjects in this study were categorized in the following age groups: 7-11, 12-15, 16-19, 20-35, 36-55, 56-65, and 66+. Before Notel had television reception, Notel residents in the two oldest age groups had more behavior setting entries than comparably aged residents of the other two towns. Two years later, the drop in participation in community activities by the two oldest age groups characteristic of Unitel and Multitel was also true of Notel. One ramification of these findings is that in a town without television, since older people are more likely to participate in community activities, they are probably more visible in the community, and younger people have more contact with them. In other words, the quantitative difference in setting entries may have a qualitative aspect as well; there may be less age segregation in a community without television. We are checking this possibility by examining our data from the point of view of settings (who participates in a given setting or category of settings?), rather than people.

The behavior settings were grouped in each town into 11 categories: sports, open areas, businesses, civic, educational, clubs, medical, dances/parties, special (e.g., weddings), religious, entertainment. Before Notel had television there were significant differences among the towns for the sports, businesses and educational categories. Notel and Multitel both had significantly more educational entries than Unitel. The sports and business results are discussed in more detail below. In the second phase of the study, there were significant differences for the sports, businesses and entertainment categories. The educational difference had disappeared. Multitel had more entertainment entries than Notel.

There were entry differences among the towns for sports and business settings in both phases of the study. Participation in business settings dropped in all three towns, but slightly more in Notel. The most likely explanation of the general drop is the economic recession evident in 1975-76 compared with 1973-74. Participation trends for sports behavior settings were quite different for the three towns. There was a fairly drastic drop for Notel, Unitel entries remained at the same level, and there was a slight increase for Multitel.

When all of these results are considered together, some patterns seem clear. The first phase results indicate that when residents do not have television reception, they participate more in community activities than do residents of comparably sized towns with television reception. The second phase results suggest that there tends to be a decrease in participation in community activities in the two years following the inception of television reception, especially for older residents. However, the decrease occurring over the two year period was not sufficiently marked to bring Notel down to the level of the two communities with television reception for ten or more years. Finally, it is interesting, although perhaps not surprising, that the type of activity in which decreased participation was most marked was sports.

Conclusion. In the space available here it has been possible to provide only a superficial and cursory outline of some of our findings. Although there are many pitfalls and problems associated with field research, we feel that this natural experiment has yielded results which will contribute to the growing body of knowledge concerning the impact of television, and which shed light on some of the theoretical issues regarding the mechanisms of television's impact. In quasi-experimental research, where random assignment of subjects to groups is not possible, statements regarding causality must be made cautiously, if at all. The process of carefully examining possible threats to the internal and external

validity of this research (Cook & Campbell, 1976) has enabled us to feel confident that our findings are indeed sound. Some of the factors which lend credence to the results are that all three towns were studied both before and after the inception of television in Notel; multiple measures were used in each of the substudies; more than one age level was studied, so changes due to maturation and development can be separated from other changes; and several well-known findings obtained by other researchers with other samples were replicated.

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